[00:00:06]Hi, I'm Nathaniel Thompson and I'm Dan Coatta and this is your Building Curiosity Update.
[00:00:11]We're standing here in front of the large spin table. This is the machine that we use
[00:00:17]to measure the mass properties of the Curiosity spacecraft.
[00:00:21]Mass properties describes the way an object moves through space.
[00:00:24]There's three mass properties that we measure; mass, center of gravity and the rotational inertias.
[00:00:31]The rotational inertias tell us how the matter is distributed and spread out. It effects how easy it is
[00:00:38]to spin the object and also how the object will wobble as it's spun. During the cruise phase,
[00:00:45]as we're flying through space to Mars, the vehicle is rotating and it's using a camera
[00:00:50]or star scanner to navigate by taking pictures of the stars. If we're rotating and wobbling,
[00:00:57]we can't get a good track on the stars and we won't be able to properly navigate.
[00:01:02]We also use antennas to communicate back with Earth. Again, if we're wobbling too much
[00:01:08]we can't correctly communicate with Earth. The principle of a rotational inertia test
[00:01:14]is very similar to the way you have your tires balanced at your local mechanic.
[00:01:17]The mechanic will rotate the tires very quickly on a machine that measures the amount that it wobbles.
[00:01:22]They will then put balancing weights on the tire until it spins smoothly. This is
[00:01:27]exactly the way we spin and balance our spacecraft. Now, we know what mass properties are.
[00:01:33]How do we go about measuring them? To do that we need a special machine called a spin table.
[00:01:39]This is a miniature version of the large table that we use to measure our spacecraft.
[00:01:44]The table floats on a cushion of air. There are sensors inside the body of the table
[00:01:50]that measures the balance of the rover on top of the table, kind of like a see-saw.
[00:01:54]We've done a lot of testing already here at JPL. Now, we're packing up our table
[00:02:00]and getting ready to ship it to Florida. In Florida, we'll be doing the most exciting
[00:02:04]test of all. A full spacecraft with fuel loaded on the table, measuring it to make
[00:02:08]sure it's ready for launch. I'm Nathaniel Thompson and I'm Dan Coatta and

[00:02:13]this has been your Building Curiosity Update.
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